

Notice of Allowability

Application No.

09/121,528

Examiner

Timothy H. Meeks

Applicant(s)

DERDERIAN, GARO J.

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/24/03 amendment and telephone conversation of 1/12/04.
 2. ☒ The allowed claim(s) is/are 1-4, 6, 8-10, 12-14, 17-35, 46-59 and 61-68.
 3. ☒ The drawings filed on 23 July 1998 are accepted by the Examiner.
 4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - (a) ☐ The translation of the foreign language provisional application has been received.
 6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No. _____.
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- 1 ☐ Notice of References Cited (PTO-892)
- 2 ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3 ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No. _____
- 4 ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

- 5 ☐ Notice of Informal Patent Application (PTO-152)
- 6 ☐ Interview Summary (PTO-413), Paper No. _____
- 7 ☒ Examiner's Amendment/Comment
- 8 ☒ Examiner's Statement of Reasons for Allowance
- 9 ☐ Other

Timothy H. Meeks
Primary Examiner
Art Unit: 1752

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mike Weinstein (Reg # 53754) on 12 January 2004.

The application has been amended as follows:

The claims have been amended as follows:

1. (currently amended) A method for depositing a platinum group metal film on a substrate, comprising the steps of:

flowing [depositing] a platinum group metal precursor in gaseous form [onto a substrate in] into a CVD deposition chamber [with] at a flow rate of from about 50 to about 500 sccm in the presence of an oxygen and nitrous oxide mixture, said mixture comprising about 5% to about 95% by volume oxygen, wherein said mixture has a combined flow rate in the range of from about 1500 sccm to about 2500 sccm and a ratio of said oxygen to nitrous oxide in said mixture is selected so as to control the roughness of said platinum group metal film, and said platinum group metal [being] film is deposited at a predetermined temperature and at a pressure of from about 10 to about 1000 Torr in said CVD deposition chamber.

In claim 3, line 1, "based" has been changed to --group--.

6. (currently amended) A method of depositing a platinum group metal film on a substrate, comprising the steps of:

introducing a substrate into a CVD deposition chamber;

bubbling an organic platinum group metal precursor into a non-reactive gas to form a gaseous mixture;

introducing said gaseous mixture to said CVD deposition chamber at a flow rate of from about 50 to about 500 sccm;

introducing oxygen to said CVD deposition chamber at a predetermined first flow rate;

introducing nitrous oxide to said CVD deposition chamber at a predetermined second flow rate, said first and said second flow rates having a combined flow rate in the range of from about 1500 sccm to about 2500 sccm, a ratio of said oxygen to said nitrous oxide being selected so as to control the roughness of said platinum group metal film; and

depositing said platinum group metal film onto said substrate in said CVD deposition chamber at a predetermined temperature and at a pressure of from about 10 to about 1000 Torr.

Claim 7 has been canceled.

In claims 8, 9, 20, 21, and 26-28, line 1, "previously amended" has been changed to --previously presented--

In claim 12, line 1, "7" has been changed to --6--.

In claim 23, line 1, "based has been changed to --group--.

In claim 24, line 1, "based has been changed to --group--.

25. (currently amended) A method for depositing a platinum film onto a substrate, comprising the steps of;

introducing a substrate into a CVD deposition chamber;

bubbling an organic platinum precursor into a non-reactive gas to form a gaseous mixture, said organic platinum precursor selected from the group consisting of cyclopentadienyl trimethylplatinum (IV) and methylecyclopentadienyl trimethylplatinum;

introducing said gaseous mixture to said CVD deposition chamber at a flow rate of from about 100 to about 250 sccm;

introducing a gaseous mixture of oxygen and nitrous oxide that is from about 5% to about 95% volume of nitrous oxide to said CVD deposition chamber, said mixture of oxygen and nitrous oxide having a combined flow rate in the range of from about 1500 sccm to about 2500 sccm, a ratio of said oxygen to nitrous oxide in said mixture being selected so as to control the roughness of said platinum film; and

depositing said platinum [group metal] film onto said substrate in said CVD deposition chamber at a temperature of from about 200 to about 600°C and at a pressure of from about 10 to about 1000 Torr.

In claim 32, line 1, --said-- has been inserted prior to "platinum".

In claim 33, lines 1-2, "based metal" has been deleted.

In claim 54, line 1, "28" has been changed to --27--.

In claim 55, line 1, "21" has been changed to --28--.

56. (currently amended) A method for depositing a platinum group metal film on a substrate, comprising the steps of:

depositing a platinum group metal film onto a substrate in a CVD deposition chamber in the presence of both oxygen and nitrous oxide[,]; and

flowing a gaseous [said] platinum group metal precursor having a flow rate in the range of from about 50 to about 500 sccm into said deposition chamber;

wherein said oxygen and nitrous oxide have a combined flow rate in the range of from about 1500 sccm to about 2500 sccm, a ratio of said oxygen to said nitrous oxide is selected so as to control the roughness of said platinum group metal film, and said depositing [being] is performed at a predetermined temperature of from about 200°C to about 300°C.

In claim 58, line 2, "preferably of" has been deleted.

61. (currently amended) A method for depositing a platinum group metal film on a substrate, comprising the steps of:

introducing a substrate into a CVD deposition chamber;

bubbling an organic platinum group metal precursor into a non-reactive gas to form a gaseous mixture;

introducing said gaseous mixture to said CVD deposition chamber at a flow rate of from about 50 to about 500 sccm;

introducing oxygen to said CVD deposition chamber at a predetermined first flow rate;

introducing nitrous oxide to said CVD deposition chamber at a predetermined second flow rate, said first and said second flow rates having a combined flow rate in the range of from about 1500 sccm to about 2500 sccm, a ratio of said oxygen to nitrous oxide being selected so as to control the roughness of said platinum group metal film; and

depositing said platinum group metal film onto said substrate in said CVD deposition chamber at a predetermined temperature of from about 200°C to about 300°C.

66. (currently amended) A method for depositing a platinum film onto a substrate, comprising the steps of:

introducing a substrate into a CVD deposition chamber;

bubbling an organic platinum precursor into a non-reactive gas to form a gaseous mixture, said organic platinum precursor selected from the group consisting of cyclopentadienyl trimethylplatinum (IV) and methylcyclopentadienyl trimethylplatinum;

introducing said gaseous mixture to said CVD deposition chamber at a flow rate of from about 100 to about 250 sccm;

introducing a 50/50 mixture by volume of oxygen and nitrous oxide to said CVD deposition chamber, said mixture of oxygen and nitrous oxide having a combined flow rate in the

range of from about 1500 sccm to about 2500 sccm, a ratio of said oxygen to nitrous oxide being selected so as to control the roughness of said platinum film;

depositing said platinum [group metal] film onto said substrate in said CVD deposition chamber at a temperature of from about 200°C to about 300°C and a time of from about 45 seconds to about 1000 seconds.

In claim 68, line 2 "preferably of" has been deleted.

The following is an examiner's statement of reasons for allowance: The limitation of "a ratio of said oxygen to nitrous oxide is selected so as to control the roughness of said platinum group metal film" added to the independent claims is supported in the specification at the sentence bridging pages 9 and 10. Although the prior art discloses to use a mixture of nitrous oxide and oxygen when depositing platinum films from organic platinum precursors to reduce carbon incorporation, the prior art does not teach or reasonably suggest to select the ratio of oxygen to nitrous oxide in the process so as to control the roughness of the deposited film as the prior art does not recognize the relationship between this ratio and the surface roughness of the deposited films.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy H. Meeks whose telephone number is 571-272-1423. The examiner can normally be reached on Mon., Tues., Thurs.(6-6:30), Fri.(6:30-10:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on 571-272-1415. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Timothy H. Meeks
Primary Examiner
Art Unit 1762

all